

# Nonpoint Source Management Annual Report 2003



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*Cover photo: Wood Turtle*



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## Introduction

The 2003 Nonpoint Source Management Annual Report provides the highlights of the New Hampshire Department of Environmental Services nonpoint source pollution related activities that occurred during the period October 1, 2002 to September 30, 2003. The major components of this report cover those activities specifically funded under the Clean Water Act 319 program.

The report begins by describing broad statewide initiatives, and then covers activities within the five major New Hampshire watersheds. We are pleased to report substantial progress in developing state-wide capacity to address stormwater pollution and stream restoration, and in improving the use of microbial source tracking technology to determine the sources of bacteria affecting coastal waters.

As the accompanying charts show, in addition to the various programs and projects managed by staff, DES awarded over \$990,000 in nonpoint source grants to local organizations during the fiscal year, to address a diverse array of pollution problems throughout the state. We hope this report provides a good overview of our progress during the year, and welcome comments and suggestions for improvement in the future.

## Smart Growth

Under the Regional Environmental Planning Program, DES convened a working group to identify appropriate and feasible measures of sprawl to help examine changes in land use over time, inform local communities about these changes and the impacts on communities, and measure progress in addressing sprawl. In addition to DES, the work group is comprised of representatives from each of the nine



*Revitalizing older buildings encourages economic growth without sprawl.*

regional planning commissions, the Office of State Planning, and UNH Complex Systems. This workgroup met several times during FY 2002 and FY 2003 to identify what data is required to best measure changes in land use consistently throughout the state and to develop a short list of indicators to evaluate on a pilot scale. This effort will continue in FY 2004.

Watershed Assistance Section (WAS) staff again participated in several successful education and technical assistance programs through the Natural Resource Outreach Coalition (NROC), a coalition of several organizations focused on resource protection in the

coastal watershed. This year, NROC began working with Somersworth, Nottingham and Candia. DES staff served as presenters and community-leads for Nottingham, and participated in follow-up activities for the other communities. In addition, DES staff contributed to the development of a water resource focused workshop, which will be offered to NROC participating communities interested in learning more about how to better protect their water resources.

WAS staff developed a workshop on “Minimizing the Impact of Development on Water Quality,” which focused on reducing NPS pollution from new residential developments. This workshop was

given to the Derry Planning Board and Zoning Board of Adjustment for the Beaver Lake Watershed Association and to the Exeter River Watershed Local Advisory Council.

## Education and Outreach

Outreach and education efforts in 2003 continued to promote the Section 319 grant program, highlighting on-going grant projects, and providing nonpoint source pollution education and resources to individuals, communities, and watershed organizations.

Grant writing and project assistance was provided to potential grant applicants through three workshops held in October in Portsmouth, Newport and Concord. The 319 grant program was promoted through the *Nonpoint Source Newsletter* where on-going projects were highlighted. In addition, the newsletter increased its mailing distribution from 580 to 660 and added an e-mail version. The DES website is also being used to promote the 319 grant program by highlighting key projects. A web page for the *Hodgson Brook Restoration Project, Portsmouth* was created and placed on the website to underline the success of the project, acknowledge the project partners, and provide a step-by-step example for future grant applicants to review.



*Storm drain stenciling helps protect New Hampshire waterbodies.*

As a response to numerous requests, efforts have expanded to provide outreach and education planning assistance and facilitation to New Hampshire watershed organizations, 319 grant applicants, and seacoast communities dealing with growth issues through NROC. Using EPA's *Getting in Step* outreach guide as a format, users have been able to plan the outreach components of grant proposals when putting together an application and/or address implementation steps for existing projects.

Nonpoint source pollution awareness continues to be promoted by *GreenWorks*, a monthly newspaper column addressing water quality and the environment. In 2003, new topics included: "Cleaner Snowmobiling in N.H.," "Ride Lightly – Protecting the Environment When Riding Off Road," and "Getting the Dirt on the Leading Source of Water Pollution." Past publications can be found at [www.des.nh.gov/gw-list.htm](http://www.des.nh.gov/gw-list.htm).

A display highlighting ongoing grant projects was exhibited at the N.H. Farm and Forest Expo, N.H. Municipal Association Conference, N.H. Rivers and Watershed Conference, and the N.H. Estuaries Conference. A new display describing what people can do in their backyards to prevent and/or decrease nonpoint source pollution was created for a general public audience. This display was used for the Exeter River Alewife Festival in Exeter and the Watershed Weekend in Freedom and will be useful addition at future Department events.

The Small Outreach and Education Grant Program for Watershed Organizations, introduced in 2002, continues to provide ongoing financial resources to organizations for outreach and education projects that target audiences with nonpoint source pollution related messages. Highlights of 2003 projects include: an introduction of water based education curriculum and teacher training in Plaistow, a Lake Winnepesaukee Association website project, and the completion of a storm drain stenciling project and how-to guide in Grafton County.



## **Phase II Stormwater Update**

Since March 2003, certain municipalities, industrial activities and developers that disturb greater than one acre of land, have been subject to new requirements dealing with storm water management, referred to as Phase II. With the introduction of the new Phase II requirements, DES realized the need to educate and inform regulated entities. In order to better coordinate resources within DES, the Watershed Assistance Section created the National Pollutant Discharge Elimination System Federal Storm Water Program (Phase II) web page at [www.des.nh.gov/Stormwater](http://www.des.nh.gov/Stormwater). In 2003, this website was rated the top Phase II website in the country by EPA. Under the new general permit issued by EPA in May 2003, regulated entities are required to develop a stormwater management program, which includes the following six minimum control measures: Public education and outreach on storm water impacts; public involvement/participation during program development; illicit discharge detection and elimination; construction site storm water runoff control; post-construction storm water management in new development and redevelopment; and pollution prevention/good housekeeping for municipal operations. To address these minimum control measures, Watershed Assistance Section staff coordinated and presented at two Phase II Illicit Connections workshops (funded through the N.H. Estuaries Project) and presented at an EPA sponsored workshop in Manchester. Staff also worked with the N.H. Department of Transportation, providing guidance to regional stormwater groups on the public education and public involvement components of their management plans.

## **Agriculture Nutrient Management Grants Program**

Since its inception in 2001, the Department of Agriculture has been assisting farmers in implementing BMPs at their facilities to improve their operations and better protect the environment for nonpoint source pollution related to agricultural operations. Since then, over \$100,000 in grants have been awarded. In addition to state funds, these grants are supported by a \$30,000 annual contribution in Section 319 funds. See Appendix E for a listing of projects awarded.



## **New Hampshire Stream Team Making Strides**

In 2001 an ad hoc group comprised of representatives from the state and federal agencies, as well as university and private entities formed the New Hampshire Stream Team. In addition to DES, the Stream Team presently consists of professionals from the U.S. Forest Service, Trout Unlimited/National Park Service, the University of New Hampshire, N.H. Fish & Game, N.H. Department of Transportation, the U.S. Army Corps of Engineers, and representatives from several consulting firms with experience in natural stream channel design (NSCD). The Stream Team's mission is to advance the use of science in river restoration and streambank stabilization efforts, and provide a venue for communication among river management stakeholders. In order to meet its mission, the Stream Team has established goals to develop a Regional Hydraulic Geometry Reference Curve, providing and/or promoting education, training, and technical assistance regarding NSCD and fluvial geomorphic principles, incorporating NSCD methods in the New Hampshire wetlands permitting process, and collaborating with other New England states and academia regarding NSCD and regional hydrologic curve development.

The N.H. Stream Team made significant progress in FY 2003. The team met in February and April of 2003 to identify suitable stream gages to be surveyed as part of the Regional Hydraulic Geometry Ref-

erence Curve, and to schedule the crews that would be needed to perform the surveys. This analysis and planning resulted in the N.H. Stream Team surveying and collecting data at gage sites on the Wild, Oyster, Baker, Pemigewasset and Ammosnoosuc Rivers. These surveys, combined with the data collected from the Smith and West Branches of the Warner River in 2002 will allow for a provisional curve to be developed in 2004.

In addition to the progress made on the Regional Hydraulic Geometry Reference Curve, the U.S. Forest Service (USFS) hosted two fluvial geomorphology short course at the Hubbard Brook research center. This opportunity allowed staff from the USFS and DES to network and to gain an understanding of fluvial geomorphology principles and river response and adjustment. The courses were so well received that DES plans to host similar training opportunities in the fall of 2003 and spring of 2004.

## **Funding Approved for Five Stream Morphology Restoration Projects in New Hampshire**

Five 319 restoration grant applications were approved in FFY 2003. These projects will focus on the identification and assessment of factors causing stream and river channel instability and the design of channel restoration plans in the Merrimack, Saco and Connecticut River Watersheds.

One such project that will see the benefits of this approach is the Swift River watershed, situated within the White Mountain National Forest (WMNF). This river system closely parallels the scenic Kancamagus Highway on an easterly course to a confluence with the Saco River in Conway, N.H. The existing Conway Scenic Railway Bridge crosses the Swift River just upstream from the confluence with the Saco River. This bridge, installed in 1892 has caused a constriction of the channel resulting in instability, active erosion, development of a large mid-channel bar upstream of the bridge and significant



*Approximately 1.5 miles of the Baker River in Warren will be part of a natural channel design-based restoration plan.*

changes in channel plan-view geometry. This constriction has also caused the avulsion or cut-off of at least three meanders causing channel scour that has threatened the stability of the north bridge abutment. The significant bank erosion and risk of infrastructure failure to the Conway Scenic Railway Bridge prompted the placement of rip-rap on the banks to prevent further erosion. This activity was permitted by DES with the condition that no future permits would be issued for this area unless a comprehensive study to determine the cause of instability along with

recommendations for a long-term solution were developed. During the summer of 2003, professional geomorphologists began collecting available data, performed bankfull discharge calibrations, reference reach and project reach surveys in order to develop a set of recommendations that will provide a long term solution for this site and return the channel to a more natural plan form. It is anticipated that initial findings and recommendations will be presented in March of 2004.

Other projects will address channel disturbance and erosion on the Pemigewasset River in North Woodstock, the Baker River in Warren, Bog Brook in Stratford and Mill Brook in Thornton. Using the principles of fluvial geomorphology and natural channel design, long lasting solutions will be created

to address the various river-related problems, restoring both the environment for fish and other aquatic wildlife, as well as avoiding more costly repairs to roads, bridges and property if only short-term solutions to the immediate problems are addressed. The Watershed Assistance Section is excited to see this trend in natural channel design based stream and river restoration continue to increase as more and more potential project collaborators take advantage of the *Generic Quality Assurance Project Plan for Stream Morphology Data Collection* and the continued efforts and outputs of the New Hampshire Stream Team.

### ***Generic Quality Assurance Project Plan for Stream Morphology Data Collection Approved by EPA***

Because the five stream and river morphology projects awarded in FFY 2003 all involve the collection of archival and field generated data to determine the appropriate methods of restoring channel stability and aquatic habitats, a Quality Assurance Project Plan (QAPP) is required to be approved by EPA prior to commencing each project. Typically, this is the responsibility of each individual grant recipient. In a unique, collaborative effort, the Towns of Stratford, Thornton and Warren along with Trout Unlimited agreed to pool resources in order to derive the match requirements necessary to have additional 319 funding provided that would facilitate the development of a *Generic Quality Assurance Project Plan for Stream Morphology Data Collection*. The QAPP was created by professional fluvial geomorphologists on staff at a New Hampshire-based consulting firm and was approved by EPA in June 2003. The *Generic Quality Assurance Project Plan for Stream Morphology Data Collection* presents the procedures conducted for stream data collection that are intended to be consistent from year to year, yielding precise, accurate, and comparable assessments of project reaches. Sampling methods outlined in the QAPP include the collection of available data, conducting stream gage surveys, reference reach surveys, project reach surveys and sediment transport evaluation along with supporting data review, verification and validation. It is anticipated that the approved stream morphology QAPP will serve as a transferable document that will assist organizations in the development of future site specific project plans related to channel morphology restoration projects.

### **Identifying Pollution Sources Using Microbial Source Tracking**

Tracking down pollution sources is sometimes as easy as finding a pipe but is more often as elusive as finding a needle in a haystack. Locating a source of pollution is the key first step in eliminating the contaminants that interfere with aquatic health and public uses of waterbodies, including, fishing and swimming and sources of drinking water. Often times these impairments are attributed to fecal-borne bacteria. In the late 1990s, WAS staff teamed up with researchers at the University of New Hampshire to find better tools for tracking down sources of fecal-borne bacteria. These bacteria can be found in lakes, streams and marine waters when sanitary wastewater flows untreated into surface water. This happens during situations such as leaking sewer pipes, overflows at wastewater treatment plants, failing septic systems and stormwater run-off.



*New ribotyping equipment at UNH Jackson Estuarine Lab helps identify pollution sources.*

Researchers found that a bacterial source tracking tool called ribotyping is an effective and innovative way to identify the actual sources of bacterial pollution present in surface wa-



ters. Instead of just knowing how much bacteria is in the water, this technology can tell us if the bacteria came from a dog, cow, human, etc. The U.S. Environmental Protection Agency and the N.H. Department of Environmental Services supported the start up costs of establishing a ribotyping laboratory at the UNH Jackson Estuarine Laboratory located on the shore of the Great Bay Estuary. Several ribotyping studies have been completed in the coastal watershed, showing promising uses for this technology statewide. For example, residents in the Hampton/Seabrook Harbor watershed suspected that birds were the primary source of bacterial pollution, but the ribotyping study results indicated that humans were responsible for a larger portion of the bacteria than birds. As a result, DES supported a pumpout boat to encourage frequent and proper disposal of boat sanitary waste, and the Town of Hampton is conducting a major sewer replacement project in the beach area of the town. More recently, UNH purchased a RiboPrinter, which allows for automated processing for ribotyping analysis. This greatly increases the consistency and accuracy of the results.

DES and UNH have conducted ribotyping studies in Varney Brook and the Bellamy River in Dover; Hampton/Seabrook Harbor in Hampton, Hampton Falls, and Seabrook; Little Harbor in Portsmouth, New Castle and Rye; Parsons Creek in Rye; Bass Beach Brook in Rye; and Chapel Brook and Little River in North Hampton. If you are interested in the reports for any of these studies contact Natalie Landry, DES at (603) 433-0877 or [nlandry@des.state.nh.us](mailto:nlandry@des.state.nh.us). If you are interested in the research aspects of ribotyping, contact Dr. Steve Jones, UNH at (603) 862-5124 or [shj@cisunix.unh.edu](mailto:shj@cisunix.unh.edu).

## Highlights and Overview of Completed Projects

The following provides summaries for those 319 funded projects that were completed in fiscal year 2003. A complete listing can be found in the appendix. The year in parenthesis is the year that the federal funds were awarded to DES.

### Coastal Watershed

#### *Stratham Circle Mill Pond Restoration (2000)*

Torrential rains, a rare weed and beaver antics were no match for determined officials in Stratham. The winter rains of 2002 and spring rains of 2003 plus a very determined beaver and the rare Star Duckweed slowed down the restoration of the Mill Pond in Stratham, but did not dampen the resolve of Stratham conservation commissioners and highway department staff to restore the pond.

The Mill Pond, located in the middle of Routes 33 and 108 had been reduced to a mere foot of water, due to excess nutrients and many years of accumulated silt. Local organizations were committed to returning the pond to its historical uses as a wildlife refuge, fishing pond and source water for the fire department. In preparation for the dredging, the conservation commission conducted an aquatic plant survey and water testing through the Volunteer Lake Assessment Program. Other preparatory work involved testing the pond sediments, finding a dredge disposal location, drawing up an easement deed, applying for a



*Stratham Circle Mill Pond before restoration.*

state permit for dredging and hiring a contractor.

The first obstacle occurred following the water testing and aquatic plant survey. The plant survey revealed the presence of a rare plant species, called Star Duckweed. According to the Division of Forest and Lands Natural Heritage Inventory, this plant is reported to exist at only three other locations in the state. Without missing a beat, a plan was developed to protect the rare species, and was subsequently approved by the Wetlands Bureau.



*And, Stratham Circle Mill Pond after restoration.*

The second obstacle involved a tenacious beaver that did not take kindly to the dewatering of the pond via lowering the dam and pumping water into the stream that flows out of the pond. As *The Exeter News-Letter* put it, “This is when the trouble started.” The beaver worked all night chopping down trees and plugging up the dam that seemingly sprung a leak. Hardy highway workers pulled the debris from the dam in what soon became a “back-and-forth battle” for a while. The highway crew resorted to using a “beaver deceiver,” which was described by the *News-Letter* as an underwater drain pipe meant to trick the amphibious mammal.

But the beaver was not fooled and spent the night plugging the underwater pipe. The beaver finally retreated to find a new home upstream when the construction trucks and backhoe arrived at the scene.

With everything ready to go in December 2002, the construction crew was waylaid by Mother Nature. The rains were so heavy that the backhoe had to be rescued one evening. Final dredging was delayed until the summer of 2003, which unfortunately did not prove to be any drier. The project was again delayed and finally completed in December 2003.

In order to avoid repeating history, the conservation commission participated in the UNH Cooperative Extension Program entitled “Follow the Flow.” This training allowed the commissioners to conduct a survey of the watershed to determine the pollution sources that silted the pond. In addition to the dumping of garden waste along the stream that feeds the pond, a significant source of pollution was runoff and erosion along Routes 33 and 108. The Town will need to conduct outreach to residents regarding dumping along waterways, as well as work with the Department of Transportation to improve erosion and sediment management along these roads.

#### *Peirce Island Shoreline Stabilization Plan, Portsmouth (2001)*



The City of Portsmouth is making great strides to increase recreational access to Peirce Island, while taking actions that protect water quality. Located on the Piscataqua River, the island houses a public boat launch, trails, and an outdoor pool. A bridge at scenic Strawberry Banke connects the mainland to the island. Grant funds supported the development of engineering and design plans to stabilize eroding sections of the island’s northern shoreline. An additional grant awarded in 2003 provided funds to stabilize the bank and significantly reduce shoreline erosion and sedimentation to the Piscataqua River.

*Shoreline erosion on Peirce Island, Portsmouth.*

*Feasibility Study for Re-establishing a Navigational Channel  
in the Oyster River, Durham (2000)*

The 2000 Town of Durham Master Plan called for maintenance dredging in the Oyster River to re-establish reliable access for boats. 319 funds were used to supplement the contributions made by the town and several researchers at the University of New Hampshire in a project to determine the feasibility of dredging a navigation channel in the Oyster River. Specific studies supported by this project included historic and present navigation channel mapping, impacts on currents and tide heights for various channel designs, recommended channel designs, chemical and physical analysis of sediments, wastewater treatment plant discharge scenarios and biological characteristics of the river. Public meetings and presentations were also part of the project tasks. The final project report recommended that to optimize use by all Durham residents, a navigable channel that extends to the Old Town Landing should be dredged. The recommendations also stated that while an easily-navigated channel to Bunker Creek is ideal for recreation, other considerations such as needs of the wastewater treatment plant and cost considerations are more significant for determining the downstream limits of the channel restoration.

*Highland Avenue Stormwater BMPs, Hampton (1999)*

This project, managed by the New Hampshire Coastal Program and partially funded through a 319 grant, involved the installation of two stormwater treatment devices and the replacement of a culvert under Highland Avenue. These actions resulted in water quality improvements to the stormwater that discharges into a tidal creek located in the town of Hampton. The stormwater treatment devices are designed to remove sediment and oils from stormwater before discharging into the estuary. Intense development in this area of Hampton, a beach community, has increased the volume of stormwater but measures to treat this increase in stormwater have not been addressed until now. This joint project was made possible through the cooperation of the Town of Hampton and the New Hampshire Coastal Program.

*Ribotyping Capacity Building for Microbial Source Tracking Investigations,  
University of New Hampshire (2001)*

The University of New Hampshire developed the capacity to analyze the DNA of bacteria in an effort to help water resource managers identify sources of water pollution. Through previous grants from the DES and the EPA, researchers at the UNH Jackson Estuarine Laboratory (JEL) developed the protocols to analyze the DNA from bacteria in feces (from humans, wild animals, domestic animals) and match it to the DNA from bacteria in polluted waters. This grant provided additional funds to JEL to purchase an instrument that automates the process known as ribotyping. A new RiboPrinter was purchased and this equipment will automate a significant part of the ribotyping analysis, helping DES in their efforts to identify and eliminate specific bacterial pollution sources.

*Identification of Pollution Sources in Little Harbor and the Atlantic Coast,  
University of New Hampshire (2000)*

Bacterial pollution in Little Harbor (Portsmouth, New Castle and Rye) and along the Atlantic Coast (Rye, Hampton, North Hampton and Seabrook) has been a concern due to the limitations placed on shellfish harvesting areas. Sanitary surveys, shoreline inspections, and elimination of numerous



sources have helped to improve water quality in these areas. However, bacterial contamination persists suggesting that significant sources of fecal pollution still exist. The recent development of ribotyping capabilities at the University of New Hampshire provided an opportunity to use this new microbial source tracking approach to address this issue.

This project involved water sample collection from sites around Little Harbor and the Atlantic coast that were identified as problem areas and possibly significant sources of fecal pollution. Sampling occurred on ebbing tides in June 2001 and from June through September 2002. Overall, the most significant “type” of source species identified was wild animals. Humans were the most commonly identified source species, and were the most prevalent source type at two specific sites (Parson Creek and Berry’s Brook/Seavey Creek). Birds were also significant at most sites, and were the most commonly identified type at Berry’s Brook. Livestock and pets were rarely identified as possible source species.

The results provide useful information for eliminating pollution sources that continue to impair these areas. The study recommends that managers focus on the identification and then reduction and/or elimination of human sources based on the significant relative percentage of human sources identified by the ribotyping method and the threat posed from fecal-borne pathogens that originate from humans and are found in surface waters. Recommendations for future actions include investigations into septic systems located on shoreline properties in addition to outreach and education efforts for septic system maintenance.

*Predictive Bacteria Model for Hampton/Seabrook Harbor  
– Department of Interior, USGS (2001)*

This study, conducted by the U.S. Geological Survey in cooperation with DES, focused on the effects of environmental factors such as rainfall on the bacteria levels in Hampton/Seabrook Harbor. In general the results showed that water samples collected during neap tides had higher bacteria concentrations than samples collected during spring tides. Also, bacteria (median) concentrations increased with increased rainfall events indicating that rainfall affects the bacteria levels in the harbor. The report also stated that stormwater runoff may be contributing to the increase in bacteria concentrations in the harbor during and after periods of rainfall. The results of this study will help in the development of restoration efforts along the coast.

**Merrimack River Watershed**

*Union Cemetery, Belknap County Conservation District (2000)*



*Reshaping the bank at Union Cemetery.*

The Union Cemetery property is bounded on the north and south by Durkee and Meadow Brooks respectively. Land management practices at the cemetery coupled with a high percentage of impervious cover in both catchment areas caused bank failures along both streams, erosion, sedimentation and sediment transport within Meadow Brook, which empties into Durkee Brook and eventually outlets into Lake Winnisquam. Technical support provided by NRCS recommended a combination of BMPs to channel stormwater runoff, stabilize streambanks and to eliminate sediment loading into the brooks. Restoration funds were utilized to construct drop inlet structures, swales and a level spreader to convey

stormwater safely to the brooks. In addition, streambanks were reshaped and reseeded in order to establish a vegetated buffer. Stormwater deflectors were also installed along laneways within the cemetery grounds in order to channel runoff into the appropriate BMPs. In order to ensure the long term success of this project, cemetery grounds managers will have to adjust their existing maintenance practices within the vicinity of these brooks. The fact that the staff of the Union Cemetery provided equipment and labor to install the BMPs, should reinforce the message of having an undisturbed riparian buffer along these brooks. The vegetation planted along the streambanks through this project will be closely monitored and supplemented as needed in the coming years.

*Stormwater Infiltration Trench at Meredith Public Boat Launch,  
Lake Winnepesaukee Association (2000)*

Funds were used to install a stormwater infiltration trench at the public boat launch in the Town of Meredith. The installation of this BMP has reduced contaminants, such as gasoline and oil, from entering the lake at this highly used area. Prior to installation of the trench, it was very common to see sheens of petroleum products flowing down the boat ramp into Lake Winnepesaukee. The Lake Winnepesaukee Partnership will utilize this completed BMP in Meredith as a demonstration site in order to encourage the installation of similar infiltration devices around the lake.



*Meredith public boat launch before ...*



*... and after restoration.*

*Water Conservation Awareness for Resource Protection  
of the Massabesic Watershed Program, Manchester Water Works (2002)*

319 funds were used to enhance the Manchester Water Works Water Conservation Program for third and fourth graders. A new water education manual was developed and classroom presentations were conducted at 16 schools. The third graders participated in a poster contest and over 800 fourth graders competed in the city and statewide science fairs. In addition, an annual field trip day at the Water Works was held for over 1,000 students.

*Gunstock and Poor Farm Brook Restoration and Remediation Project,  
North Country Resource Conservation and Development Area, Inc. (1999)*

Flooding, erosion, nutrient and sedimentation problems were corrected along Poor Farm Brook and several sites along Gunstock Brook. Both brooks originate in the Belknap Mountains and discharge di-



rectly into Lake Winnepesaukee within the Town of Gilford. At three sites along Gunstock Brook, bio-engineering stabilizing techniques were used including installing root wads, brush mattresses of live willow and alder braches, and geo-grids with layers of live willow and alder branches. Much of the bioengineered practices were implemented along streambank reaches where traditional armoring with stone had failed. The deep-rooting shrubs, willows and alders planted by volunteers will establish a vegetated buffer along the streambank and provide in-stream cover for fish communities. Eastern Brook Trout had colonized the shaded pools created by the newly installed root wads approximately four months after installation on Gunstock Brook.



*Gunstock Brook with rip-rap and brush mattresses.*

A combination of stone, boulder and vegetative stabilization techniques were also implemented on a severely eroded reach of Poor Farm Brook in Gilford. A section of streambank along Poor Farm Brook has been integrated into a cross country trail and as a result has experienced extensive erosion from heavy usage. A combination of stone and vegetation were utilized to create a stable streambank at this site. Collaboration between the Town of Gilford, the Belknap County Conservation District, the North Country Resource Conservation and Development Area, Inc., AmeriCorps and staff from the Gunstock Recreational Area was essential for the success of this restoration effort.

#### *Innovative Street Specification Manual, Pennichuck Water Works, Inc. (2001)*

This project resulted in the creation of a new street specification manual for the City of Nashua. Since the city's existing specifications for streets and sidewalks did not consider environmental factors, including NPS pollution, this innovative manual was designed to take into account environmental concerns while still adequately addressing safety and flood prevention. The result will be the reduction of stormwater runoff pollution into the city's water bodies.

#### *Piscataquog River Stream Bank Restoration, Piscataquog Watershed Association (2001)*



*Utilizing the principles of natural channel design and fluvial geomorphology, the flow of the Piscataquog River is redirected to protect the stream bank.*

The south branch of the Piscataquog River in New Boston was experiencing degradation from road run-off and erosion immediately upstream of the Gregg Mill Bridge. Lateral migration of the river channel into the south bank of the river had also caused excessive undermining of bank materials and threatened several mature trees. Extensive planning was involved from numerous stakeholders to develop an effective bioengineering solution for this site that would incorporate the principals of natural channel design and fluvial geomorphology. The final design involved installation of rock veins on the south bank and a porous, rock weir to redirect flow to the center of the river. Adjustments were also made to an existing riffle and point bar just upstream of the bridge. Careful consideration was made to protect the endangered brook floater mussels (*Alasmidonta varicosa*) with the use of silt fences, an oil boom and turbidity curtain dur-

ing construction. Initial observations suggest that the BMPs are working to redirect the flow, move the appropriate sediment load and stabilize the channel although continued monitoring will need to occur to determine the long-term viability of the project. Baseline channel cross-sections and longitudinal profiles were generated by a river restoration specialist from Trout Unlimited. Future cross-sections and profiles will be generated to monitor the physical response of the channel to the BMPs. The resident fish population was also sampled and documented to establish a baseline community index for the restoration site and a control site upstream. Subsequent fish surveys will document the response of the biological community to the BMPs. Project coordinators were excited to see that several brook trout had relocated to the newly created pool on the downstream edge of a rock vein within an hour of installation.

#### *Squam Lakes Wastewater Management Planning, Squam Lakes Association (2000)*

Funding was provided to the Squam Lakes Association for research and the production of reports on monitoring data trend analysis for the lake's and major tributaries in the watershed, septic system survey data, and a plan for improved wastewater management for identified areas of concern.

#### *Schoodac Brook Conservation Plan, The Nature Conservancy (2001)*

The result of this project was the development of a conservation plan for the Schoodac and Frazier Brook watershed in Warner, Webster and Salisbury. Of particular concern was the long-term protection of three rare turtle species found in the watershed – Blandings, spotted and wood turtles. Specific habitats were identified through field investigations, topographic maps, aerial photographs and GIS and GPS technology. By identifying these critical habitats and the conservation strategies necessary to protect them, local communities can now pursue appropriate land protection and land management practices.

#### *Baboosic Lake Community Septic System, Phase I, Town of Amherst (2001)*

To alleviate phosphorous contamination to Baboosic Lake, the numerous substandard septic systems along the shore need to be addressed. The town of Amherst has proposed the construction of a community septic system with a goal of removing as many individual septic systems as possible. Phase I of the project, involved the hiring of a contractor to determine the feasibility of constructing a community wastewater disposal system on town property and to identify the number of households that could be serviced by the system. Initial estimates indicate that the community system designed for Baboosic Lake could accommodate up to 50 homes. At full operating capacity, this community septic system would remove approximately 43 kilograms of phosphorus each year from the Baboosic Lake watershed.

#### *Glen Lake Restoration Project, Town of Goffstown (2000)*

This restoration project restored and stabilized approximately 500 feet of Shoreline on Glen Lake, an impoundment of the Piscataquog River in Goffstown. The popularity of this three acre, town-owned site for boaters and other public uses had resulted in significant erosion, sedimentation and NPS pollution to the lake. Pollutant loading estimates indicated that nearly 18 to 20 tons of sediment entered the lake from runoff that caused widespread erosion along the shoreline abutting the boat ramp. The boat ramp itself was poorly defined and consisted of loose gravel and sand and further contributed sediment, nutrients and other nonpoint source pollutants to the lake. This project relocated the parking



*Dedication monument at the Waterfront at Glen Lake, Goffstown.*

area away from the shoreline and redirected street runoff to vegetated buffer strips and treatment swales. A new concrete-log style boat ramp was installed with readying lanes. The shoreline was terraced and vegetated with indigenous plantings and new walkways constructed to direct pedestrians away from sensitive areas. An educational kiosk was installed to heighten environmental awareness, provide information on nonpoint source pollution and to inform the public about boating safety and laws etc. The scale, design and implementation of this restoration project were extremely impressive and incorporated a wide variety of watershed

stakeholders. In recognition of the innovative designs, collaborative effort and the completion of this comprehensive project, "The Waterfront at Glen Lake," was selected as the "Project of the Year" by the New Hampshire Office of State Planning in 2002.

### *Great Pond Watershed Education and Outreach, Town of Kingston (2000)*

This project focused upon implementing the recommendations of the DES Diagnostic/Feasibility Study completed for Great Pond. The two major components identified in the recommendations section of the Diagnostic/Feasibility Study were education and outreach to watershed residents within the towns of Kingston and Danville and implementation of catchment level BMPs to address stormwater runoff. Elements of the education and outreach efforts included direct mailings to watershed residents that targeted watershed education and the Diagnostic/Feasibility Study findings. Implementation of the Interactive Lake Ecology Program at Camp Lincoln was also initiated on the shores of Great Pond with over 300 children participating on an annual basis. The Town of Kingston DPW installed stormwater BMPs following designs submitted by the Natural Resource Conservation Service. A stone-lined swale with settling basin and level spreader were installed to eliminate excessive sediment and nutrient loading from an unnamed tributary to Great Pond. The BMP installation site was identified as a high priority restoration site by the Diagnostic/Feasibility Study.

### *Batchelder Hill Road Drainage Improvements, Town of Meredith (2001)*

This project helped alleviate a turbidity and sedimentation problem in Lake Winnisquam as a result of runoff from this steep dirt road. Funds were used to crown and pave the road to direct surface runoff to existing roadside BMPs. Increased development in the surrounding areas of Batchelder Hill Road had caused a dramatic increase in traffic volume on this steep dirt road over the past three years. The increase in traffic volume caused deep ruts to form during the wet seasons and significant rain events. These ruts acted as conduits for stormwater runoff and bypassed the existing stormwater BMPs that consisted of turn-outs and constructed wetland cells. The Town of Meredith was constantly regrading the road with approximately 350 cubic yards of gravel and dirt each year. Sediment transport off this steep road had created a sediment and gravel delta below the outlet along the shore of Lake Winnisquam. Although asphaltting a road isn't a typical BMP supported through the 319 program, the severe slopes, traffic volume and annual sediment loading to Lake



*Batchelder Hill Road runoff prior to paving.*



Winnisquam from this site justified the need for this type of treatment. Stormwater is now directed into vegetated areas along the side of the road through sheet-flow. Excess runoff is channeled into catch basins with improved sumps and outlet structures before either infiltrating or meandering in a seasonal tributary channel to Lake Winnisquam.

#### *Outreach and Education, Upper Merrimack River Local Advisory Committee (2001)*

Funding was used to expand the UMRAC outreach efforts through the creation of a presentation focusing upon NPS issues in the Upper Merrimack River Watershed, purchase of a multi-media projector and two kick nets for field work demonstrations. Volunteers were trained on how to present “The Merrimack River: What’s a Watershed Citizen to Do?” program. An evaluation form was developed for those who attend the presentations to provide feedback on its effectiveness. The form also provided an opportunity for attendees to express an interest in volunteering for future projects to protect the watershed. UMRAC members utilized the multi-media projector to make presentations to city council members, conservation commissions, civic organizations, schools and other venues within the watershed. Based upon the “pre” and “post” presentation attitudinal surveys, attendees at the workshops and presentations are clearly gaining knowledge on the topic of nonpoint source pollution and prevention as well as the activities conducted by the UMRAC.

### **Connecticut River Watershed**

#### *Chalk Pond Sediment and Erosion Control Project, Town of Newbury (2001)*

This project combined the installation of stormwater BMPs to control erosion from the roads around Chalk Pond with an education and outreach component to address septic systems and other NPS areas



*Education kiosk, Sunapee Hills Association Beach, Chalk Pond, Newbury.*

of concern. Each home’s septic system construction date, size, and permit for the Sunapee Hills Chalk Pond area was researched in both town and state records. All residents were provided with an educational packet on the importance of proper septic system maintenance, the impacts of phosphorous to the pond and an overview of aquatic plants in the pond. In addition, a kiosk was constructed at the Sunapee Hills Association Beach to post information about the pond and how to protect it. Design and installation of gravel road stormwater BMPs was an integral component of this project and collaboration between NRCS technicians and the Town of Newbury. Improvement of existing swales, replacement of culverts and the installation of a level

spreader and new drainage lines has eliminated erosion from ditches and minimized the impact of runoff from gravel roads. One of the most innovative measures implemented during this project was the elimination of a stormwater drainage culvert that discharged directly into Chalk Pond. In order to accommodate the stormwater runoff that used to outlet at this location, a new drainage line was created under Chalk Pond Road that now discharges below Chalk Pond in the vicinity of the surface waters that outlet the pond. Sediment and nutrient loading to Chalk Pond from the Gerald Drive subwatershed has been eliminated through the creation of this BMP.

*Sunapee Roadways NPS Pollution Reduction, Phase I,  
Lake Sunapee Protective Association (2002)*

Phase I of this project was completed in FFY 2003, the purpose of which was to identify specific sites in the Lake Sunapee watershed, which would benefit most from the installation of BMPs to reduce NPS pollution runoff from roadways. The results of this project recommended specific BMPs at six identified sites in the watershed. The implementation of the BMPs at these sites is incorporated into Phase II of the project, which was awarded funding this same fiscal year. The completion of Phase II will reduce the amount of nutrient and silts that currently enter lakes and streams from roadway runoff.

*MacGlaulin Farm Nutrient Management,  
Sullivan County Conservation District (1999)*

319 funds aided in the construction of a 150 ft. x 150 ft. x 10 ft. concrete manure storage facility at the MacGlaulin Farm in Claremont. This combined with the implementation of a nutrient management plan for the property will reduce the potential of excessive nutrients entering the Sugar River from inadequate manure storage and improper application to the land.



*Manure storage facility, MacGlaulin Farm.*

**Saco River Watershed**

*Chocorua Lake Restoration Project, Phase III,  
Carroll County Conservation District (2000)*

Water quality in Chocorua Lake continues to improve with the construction of BMPs at 20 sites along Chocorua Lake Road, Loring and Philbrook Roads, which drain into Stratton Brook, a tributary of Chocorua Lake. Phase I of the project was completed in FFY 2002 and Phase II is on-going with water quality monitoring efforts. In Phase III, water was diverted from Chocorua Lake Road to a stabilized wooded area. A sediment basin was also constructed to capture dirt and gravel prior to reaching Stratton Brook. Erosion problems were also corrected at the intersection of Loring and Philbrook Roads and a new area, away from the brook, was prepared to stockpile snow from plowing activities.

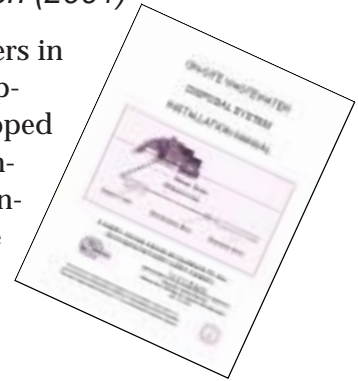
*Pleasant Lake Watershed Survey, Pleasant Lake Watershed Association (1998)*

Increased nutrients and high conductivity in some brooks and streams in the Pleasant Lake Watershed led to the Pleasant Lake Association conducting this detailed watershed survey to determine the type and source of potential contaminants to the lake and to recommend BMPs. Results of this two-year study show that the lake is in good health overall, rating an oligotrophic classification. The next steps in the study are to protect undeveloped land through appropriate zoning ordinances, and to work with lake residents to prevent future degradation of the lake's water quality. DES will work with the towns of Deerfield and Northfield, and lake and watershed associations on the development of appropriate GIS overlay zoning regulations.

## Statewide Efforts

### *Septic Installers Manual and Training, Granite State Designers and Installers Association (2001)*

This manual was created to help new and experienced septic system installers in understanding how to properly install a septic system in accordance with approved plans. In addition, a revised, updated exam for installers was developed and implemented. Seminars were also held on understanding “designer’s intent” and on the use of proper fill materials. The above activities will help ensure that the installation of septic systems will be properly installed, use the right materials, and will be subject to fewer failures, thus protecting the state’s surface and ground waters.



### *Erosion and Sediment Control Workshops for the Construction Industry, Granite State Designers and Installers Association (2002)*

A day-long seminar, including classroom instruction and on-site demonstrations was held for approximately 80 excavation contractors, engineers and septic system professionals on the regulatory requirements and BMPs to control erosion and sediment during site excavation and construction.

### *Support for Statewide Watershed Efforts, North Country Resource Conservation and Development Area, Inc. (2001)*

Funding was used to create five state Watershed Corps positions to provide support and coordination to local watershed groups in the five primary river basins in New Hampshire for one year. Corps members worked primarily with the Lake Winnepesaukee Association as well as the Green Mountain Conservation Group, and provided assistance with watershed planning and implementation efforts, including helping local volunteers establish new watershed organizations, water quality monitoring, pollution prevention education, management planning for exotic and invasive species, and working with riparian land owners to encourage creating and maintaining riparian buffers.

## Looking Ahead

As part of its effort to continuously improve water quality and the provision of services to the public, the DES Watershed Management Bureau is planning to implement pilot watershed approach projects by fiscal year 2005. In the coming year, a request for proposals will be issued for local organizations looking for technical and financial assistance to develop and implement watershed management plans.

Under the watershed approach, DES will offer increased services in high priority watersheds – those most in need of restoration, protection, or planning to address threats. Such services could include monitoring, facilitation, watershed surveys, data interpretation, and plan development. Funds will be available to fill in the gaps needed by the pilot program organizations to address their water quality concerns. We hope to learn a lot and ultimately, to improve the services we provide by working on these pilot watershed approach projects. Our goal is to achieve clean water as efficiently as possible, and we’re looking forward to the challenge.

## Appendices

### A. Section 319 Watershed Restoration Grants Awarded in FFY 2003

Grantee	Project Name	Source of Funds (FFY)	Grant Award
<b>Coastal Watershed</b>			
University of New Hampshire	Ribotyping Capacity Building for Microbial Source Tracking	2001	\$25,000
Strafford County	Strafford County Canoe Launch	2001	\$1,044
City of Portsmouth	Peirce Island Shoreline Stabilization	2002	\$48,000
Assn. of US Delegates to the Gulf of Maine Council	Gulfwatch Blue Mussel Monitoring - 2001	2001	\$1,845
Cocheco River Watershed Coalition	Cocheco River Environmental Quality & Recommended Monitoring and Restoration	2001	\$11,330
Assn. of US Delegates to the Gulf of Maine Council	Gulfwatch Blue Mussel Monitoring - 2002	2002	\$3,978
		<b>Subtotal:</b>	<b>\$91,197</b>
<b>Merrimack River Watershed</b>			
City of Manchester	Dorrs Pond Tributary Improvement	2001	\$48,321
Keywaydin Park Association	Keywaydin Dredging Project	2001	\$8,340
Town of Amherst	Baboosic Lake Community Septic System - Phase II	2001	\$99,333
Town of Litchfield	Darrah Pond Erosion & Sediment Control	2001	\$9,681
City of Manchester	Crystal Lake Water Quality Improvements	2002	\$73,483
Belknap County Conservation District	Reducing Nutrient Load to Huckins Pond from Swain Farm	2002	\$51,130
Nashua Regional Planning Commission	Souhegan River Watershed Management Plan	2002	\$21,000
Balmoral Improvement Assn.	Middle Brook Canal Dredging	2002	\$51,126
Town of Amherst	Baboosic Lake Community Septic System - Phase III	2002	\$7,800
Breezy Point Condominium Association	Breezy Point Shoreline Stabilization	2002	\$11,300
Trout Unlimited	Pemigewasset River Restoration	2002	\$14,038
Town of Thornton	Mill Brook Stabilization	2002	\$27,527
Town of Warren	Baker River Restoration	2002	\$13,667
		<b>Subtotal:</b>	<b>\$423,079</b>
<b>Saco River Watershed</b>			
Swift River Local Advisory Committee	Channel Stability Analysis at Conway Scenic Railroad Bridge	2001	\$9,600
		<b>Subtotal:</b>	<b>\$9,600</b>
<b>Connecticut River Watershed</b>			
Town of Stratford	Bog Brook Restoration	2002	\$13,122
		<b>Subtotal:</b>	<b>\$13,122</b>
		<b>Award Totals</b>	<b>\$536,998</b>

## B. Section 319 NPS Local Initiative Grants Awarded in FFY 2003

Grantee	Project Name	NPS Category	Source of Funds (FFY)	Grant Award
Lake Sunapee Protective Association	Sunapee Roadways NPS Reduction – Phase II	Urban Run-off	2003	\$37,249
Lake Winnepesaukee Assn.	Tributary Monitoring in the Winnepesaukee Watershed	General	2003	\$18,106
Town of Deerfield	Boathouse and Drainage Management at Veasey Park	Subsurface Systems	2003	\$25,000
University of New Hampshire	Riparian Buffer Project – Part II	Hydrologic and Habitat Modifications	2003	\$77,312
University of New Hampshire	Development and Implementation of Nutrient Management Plans – Year 2	Agriculture	2003	\$40,000
Green Mountain Conservation Group	Ossipee Lake Protection Project	General	2003	\$17,000
NH Municipal Association	Motor Vehicle Salvage Facility Regulation Handbook	Junk, Salvage and Reclamation Yards	2003	\$16,474
Town of Lisbon	The Ammonoosuc River	Urban Run-off	2003	\$20,250
The Nature Conservancy – NH Chapter	Ashuelot River Watershed Land Conservation Plan	Hydrologic and Habitat Modifications	2003	\$17,480
Belknap County Conservation District	Center Harbor Bay Subwatershed Evaluation	Urban Run-off	2003	\$21,519
Town of Newbury	Gillingham Drive Stormwater Improvement – Phase II	Road Maintenance	2003	\$17,350
Granite State Designers and Installers	Septic Aging, Soil Identification & Analysis Seminars	Subsurface Systems	2003	\$13,925
University of New Hampshire	NH's Natural Stream Communities	General	2002, 2001 1998	\$127,861
Upper Valley Lake Sunapee Regional Planning Commission	2002 604(b) UVLSRPC's Technical Support Project	General	2002	\$5,400
<b>Total Awards:</b>				<b>\$454,926</b>

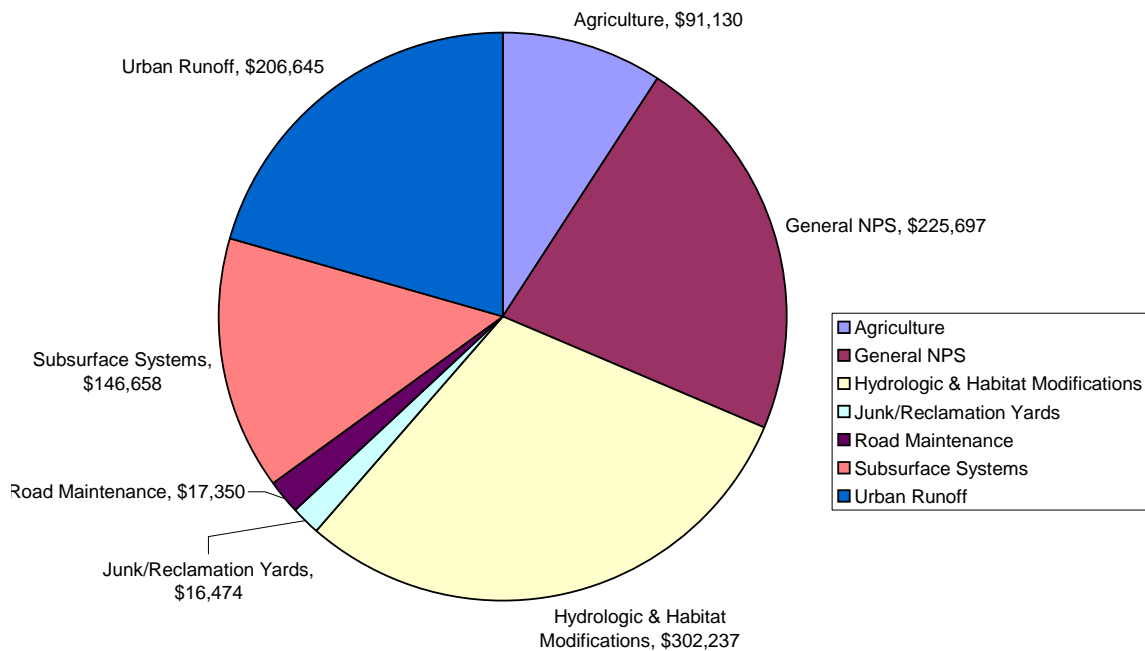


### C. Section 319 Projects Completed in FFY 2003

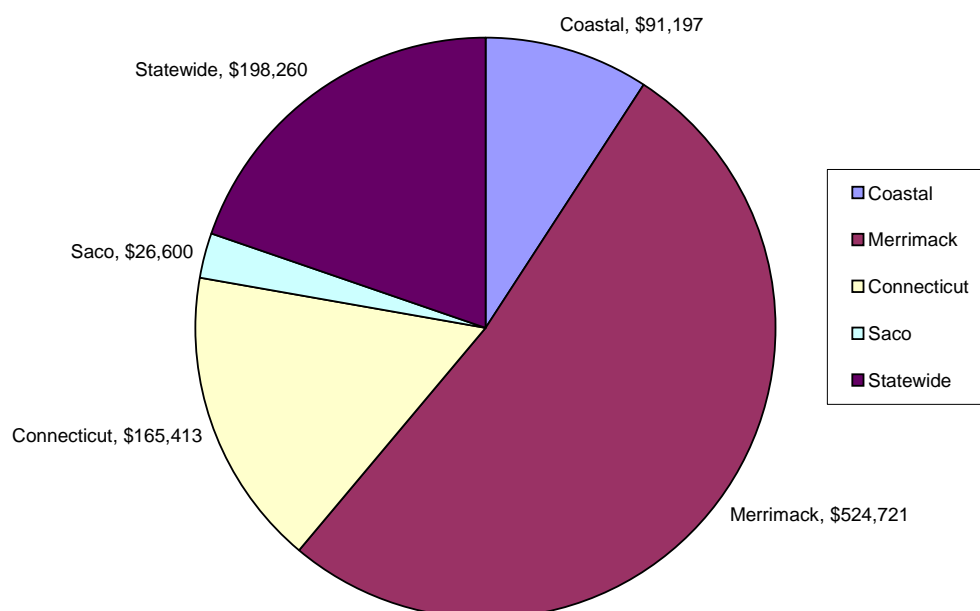
Grantee	Project Name	FFY Funds	Grant #	319 Funds	Date Completed
Belknap Cnty Cons. Dist.	Union Cemetary	2000	R-00-M-07	\$2,690	6/30/2003
Carroll County Conservation District	Chocura Lake Restoration – Phase III	2000	R-00-S-02	\$6,650	4/28/2003
City of Portsmouth	Peirce Island Shoreline	2001	R-01-C-04	\$7,200	7/10/2003
Dept. of Interior, USGS	Predictive Bacteria Model Hampton Harbor – Phase III	2001	R-01-C-11	\$35,490	11/30/2002
Granite State Designers and Installers Assn.	Septic Installers Manual	2001	B-01-M-15	\$14,379	12/30/2002
Granite State Designers and Installers Assn.	Erosion Control Seminars	2002	B-02-SW-12	\$7,300	10/23/2002
Lake Sunapee Prot. Assn.	Sunapee Rdwy NPS Reduct	2002	B-02-CT-01	\$3,486	12/18/2002
Lake Winnepesaukee Association	Stormwater Infiltration Trench, Meredith	2000	R-00-M-08	\$2,350	12/2/2002
Manchester Water Works	Massabesic Water Conservation Awareness	2002	B-02-M-10	\$20,000	9/17/2003
North Cntry Res. Cons. & Development Area, Inc.	State Watershed Corps	2001	B-01-SW-16	\$7,724	12/2/2002
North Cntry Res. Cons. & Development Area, Inc.	Gunstock & Poor Farm Brook Restoration	1999	R-99-M-01	\$25,345	12/2/2002
Pennichuck Water Works	Innovative St. Spec. Manual	2001	B-01-M-18	\$40,000	1/17/2003
Piscataquog Watershed Association	Piscataquog River Riparian Restoration	2001	B-01-M-09	\$11,547	5/20/2003
Pleasant Lake Watershed Association	Pleasant Lake Watershed Survey	1998	B-98-S-02	\$3,000	9/22/2003
Squam Lakes Association	Squam Lake Wastewater Management Planning	2000	B-00-M-14	\$9,000	12/6/2002
Sullivan County Conservation District	MacGlaulin Farm Restoration Project	1999	R-99-CT-01A	\$37,225	4/7/2003
The Nature Conservancy – NH Chapter	Schoodac Brook Conservation Plan	2001	B-01-M-07	\$7,331	2/5/2003
Town of Amherst	Baboosic Lake Com. Septic	2001	R-01-M-04	\$10,619	10/29/2002
Town of Durham	Feasibility Study for Re-establishing a Navigational Channel in the Oyster River	2000	R-00-C-03	\$29,200	5/5/2003
Town of Goffstown	The Waterfront at Glen Lake	2000	R-00-M-01	\$64,625	6/6/2003
Town of Hampton	Highland Avenue Stormwater BMP Project	1999	R-99-C-01	\$34,775	11/5/2002
Town of Kingston	Great Pond Watershed Protection	2000	B-00-M-02	\$2,511	12/6/2002
Town of Meredith	Batchelder Hill Road Drainage Improvements	2001	R-01-M-08	\$35,161	5/6/2003
Town of Newbury	Chalk Pond Sediment and Erosion Control	2001	B-01-M-13	\$33,035	10/14/2002
University of New Hampshire	ID of Pollution Sources & BMP Design in Little Harbor & Atlantic Coast Watershed	2000	R-00-C-08	\$41,000	7/14/2003
University of New Hampshire	Ribotyping Capacity Building for Microbial Source Tracking	2001	R-01-C-10	\$25,000	5/7/2003
Upper Merrimack River Local Advisory Comm.	Data Presentation Outreach & Education	2001	B-01-M-04	\$3,514	2/12/2003

## D. Graphs Showing Distribution of FFY 2003 Section 319 Grant Dollars

### Distribution of 2003 Awarded Section 319 Grant Dollars by NPS Category



### Distribution of 2003 Section 319 Grant Dollars by Watershed



## E. Agricultural Nutrient Management Grants Awarded SFY 2003

<b>Grant Award</b>	<b>Management Practice</b>	<b>Recipient</b>	<b>Town</b>	<b>Operation Type</b>
\$2,500	Fencing livestock from wetland	Amanda Bevard	Sanbornville	Misc. Livestock
\$2,500	Silage leachate collection system	Jalco Farm	Haverhill	Dairy Farm
\$2,496	Roadway improvement/erosion prevention	Cornerstone Farm	Lee	Equine Operator
\$2,500	Heavy use area concrete & culvert	Great Oak Farm	Webster	Dairy Farm
\$1,739	Fencing livestock from wetland	Deere Mountain Farm	Wentworth	Goat Dairy
\$2,500	Barnyard drainage improvem'ts	Woodman Farm	Claremont	Dairy Farm
\$944	Manure storage drainage improvements	Echo Farm	Hinsdale	Dairy Farm
\$1,890	Covering manure storage area	David O'Hearn	Northfield	Misc. Livestock
\$2,500	Manure stacking & handling pad	Angel's Nest Farm	Nottingham	Sheep Farm
\$2,445	Fencing livestock from stream and wetland	Five G Farm	Plymouth	Goat Dairy
\$1,600	Controlled wetland/stream crossing & fencing	Kevin Straughan	Center Ossipee	Misc. Livestock
\$2,500	Education	NH Landscapers Assn.	Statewide	Trade group
\$359	Education	NH Horse Council	Statewide	Trade group
\$690	Education	Merrimack County Conservation District	Various	Conserv. District
\$2,024	Portable Scales to assist with nutrient management	UNH Cooperative Ext.	Cheshire County	Various
\$2,024	Portable Scales to assist with nutrient management	UNH Cooperative Ext.	Sullivan County	Various
\$2,500	Manure storage structure	Robin DeFeo	Sandown	Equine Operator
\$2,500	Barnyard drainage improvem'ts	Mock Farm	Webster	Beef Cattle
\$2,500	Alternative water source and livestock fencing	Rock Meadow Farm	Francetown	Beef Cattle
\$2,000	Manure composting facility	Larry Wheeler	Barnstead	Dairy Heifer Farm
\$2,500	Composting, fencing and barnyard improvements	Arbutus Hill Farm	Meredith	Misc. Livestock
\$2,500	Manure storage facility	Coos County Farm	W. Stewartstown	Dairy Farm
\$2,500	Barnyard drainage improvem'ts	Bruce Savage	Lancaster	Dairy Farm
\$2,500	Manure composting facility	Bruce & Ellen Clement	Westmoreland	Sheep Farm
\$1,386	Fencing from lake	Roger & Adele Sanborn	Boscawen	Cattle Pasture
\$2,500	Manure storage facility	Winning Ways Stable	Dover	Equine Operator
\$2,500	Manure storage facility	Lana Dearborn	Northfield	Equine Operator
\$900	Controlled wetland crossing/fencing	Kevin & Janna Straughan	Center Ossipee	Misc. Livestock
\$2,500	Roof for compost storage area	Graymist Farm	Groveton	Dairy Farm
<b>\$60,497</b>	<b>Total Awards</b>			